BOMBAY NATURAL HISTORY SOCIETY'S MAMMAL SURVEY OF INDIA, BURMAH AND CEYLON

Report No. 46 (Supplementary)

ON THE SECOND, THIRD AND FOURTH COLLECTIONS FROM TOUNGOO, BURMAH, MADE BY MR. J. M. D. MACKENZIE, I.F.S., BETWEEN DATES FEBRUARY 9, 1927 TO MARCH 2, 1928

BY

T. B. Fry

In the Report (No. 46) for the first of the series of collections made in the Toungoo District no attempt was made to describe the character of the country worked over, and this no doubt may have been considered a defect by some readers of the Journal. However, Mr. Mackenzie has now furnished the Society with data on this subject in addition to many interesting notes on the habits of various animals observed by him, together with information of a similar kind gathered from local native hunting and cultivating people. The omission noted above will therefore be best rectified by the inclusion of these notes in full in this supplementary report, which deals with practically all the animals referred to in the original report.

The notes relating to sundry animals are of special value since in some cases they confirm the published views of former observers, while in others they indicate that mistaken ideas have sometimes been adopted.

Two further points only seem to call for remark in these three collections; one being that Mr. Mackenzie has scored a success in obtaining another specimen of what appears to be a rare bat '*Rhinolophus affinis tener*', and secondly attention may be drawn to the fact that Toungoo, Pegu and the Shan States appear to form a meeting ground for several of the Northern and Southern Burmese forms of mammals, such as for example *Cynopterus sphinx* and *Cynopterus brachyotis angulatus*, *Tamiops m. manipurensis*, *macclellandi*, and *m. barbei*, possibly also *Herpestes birmanicus* which differs but little from *H. nepalensis*. This fact gives rise to doubts whether some of these animals to which specific names have been accorded, may not eventually be regarded as merely local races.

Notes on a Collection of Mammals from Toungoo, Burmah

Nos. 879 to 1489 (About)

Area concerned.—The area concerned is that part of the North Toungoo Forest Division, lying between the top of the ridge of the Pegu Yoma on the West and the West boundary of the unadministered Karen hill tracts on the East, a line running about 15 miles

East of the Sittang River, which is the main river in the area. It is roughly rectangular, 35 miles from North to South and 40 miles from East to West. Between longitudes 95° 50′ and 96° 30′ East and latitudes 19° 30′ and 18° 55′ North. The Burma Railway line from Rangoon to Mandalay runs the whole way a mile or so West of the Sittang River. It really forms a continuation of the collections made in South Pegu (No. 28) and Prome. South Pegu is the drainage of the Pegu River, extending to the sea in the South as far East as the Sittang. There is a gap of about 80 miles between this area and the present one. The Prome collection was made in the extreme Northern part of the drainage of the Rangoon River (including Prome itself in this, though it is on the Irrawaddy) East to the Pegu Yoma ridge. Though this area is actually some 30 miles South of the present one, it gives a fair representation of the Western slopes of the Pegu Yomas, while the Toungoo and Pegu collections give the Eastern slopes. The Toungoo collection differs from the Pegu one in covering a certain area East of the Sittang River. The grey squirrel, *Tomeutes phayrei*, was found exclusively on the East bank; while *rufigenis* (Nos. 1479, 1484, 1485, etc.) was only found in the Karen hills on the East. There may well be other differences in the fauna East and West of the Sittang, which is big enough to form a barrier, with the strip of paddy cultivation on both banks.

I enclose notes[1] from the Gazetteer; but the division may roughly be described as a patch of paddy cultivation either side of the Sittang, with jungle beyond it in both directions. On the west, this jungle is mainly moist deciduous forest, with patches of dry jungle of which *Dipterocarpus tuberculatus* is typical (Burmese In, or Eng, the type of jungle being called 'Indaing') near the Railway. There are considerable areas of reserves, one patch along a ridge some 5–10 miles West of the Sittang, the next on the Pegu Yomas slopes, with a 10 miles strip of unclassed forest in the valley between, in which there are villages and a good deal of cultivation, permanent and shifting (Taungya). On the East there is a strip of re-

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[1] From the Gazetteer, Toungoo District (1914).

Note.—These refer to the district of which the N. Toungoo Forest Division is only the Northern part.

'The rocks of the Pegu Yoma are, so far as is known entirely of tertiary age, consisting of miocene beds of shale and sandstone belonging to the Pegu group. The ranges to the East of the Sittang are far more ancient and are composed principally of crystalline gneissic rocks. In the N.E. of the district there are outcrops of harder rocks of a granitoid type. The centre of the district consists of the Sittang alluvium merging in the N.W. into fossil wood beds, which are almost entirely denuded. Large quantities of limestone are found in parts of the N. Toungoo division. . . . (There are also beds of laterite. *D.M.*)

Fauna :—Animals (*sic.* i.e. mammals. *D.M.*) Those not mentioned already in my notes are :—Clouded Leopard : bear (2 kinds) Serow and Gooral occur in the Eastern hills, but unless exceptionally, not in the Pegu Yomas ; other animals found are Wild dogs (two kinds) (I doubt this. *D.M.*). . . .

Rainfall is said to decrease from S. to N., i.e. Yedashe, 20 miles N. of Toungoo, and about half way through the area is given as 70″ only. This is as would be expected, but is not necessarily an indication of the fall in the jungle clad slopes on either side of the valley. *D.M.*

The forests on the E. slopes of the Pegu Yomas are of a moister type than those on the W. (Prome). *D.M.*

serves, moist deciduous forest with considerable patches of Indaing on the West beyond which lie the Karen foothills in which most of the cultivation is Taungya, except for extensive betel gardens, mostly terraced and irrigated. To the extreme East lie the Karen hills, with Thandaunggyi, the highest point 4,822 ft. above sea-level. Hilly, broken country continues into Karenni, where Fea collected, some 15–20 miles to the East, but no specimens in this collection come from further East than Thandaung. To the South and East of the area lies Shwegyin, the ' Schay Gyeen ', etc. of Blanford.

Toungoo itself is 166 miles north of Rangoon and is on the extreme South of the area.

In addition to the Railway, there is a certain amount of small boat traffic on the Sittang, and there are trade routes running to the East on which pack bullocks are the chief form of transport. There is the Mandalay-Rangoon road, running North and South along the Railway which is only now in process of being metalled, though it has been in use for carts for many years. The only other metalled road of any length in the area is the Thandaung road, from Toungoo to Thandaung, 30 miles almost due East (about 18 miles as the crow flies) all except the first 5 miles running through a strip of reserved forest. At Thandaung, there is a tea estate, and there are rubber estates elsewhere East of the Sittang. Conditions vary considerably ; rainfall is 87 inches in Toungoo and 225 inches in Thandaung, 18 miles away, but 4,500 ft. higher. Toungoo itself is only about 100 ft. above sea-level. The Pegu Yoma ridge runs up ot 2,000 ft. and the Karen hills on the East vary from 4,822 ft. to say 2,000 ft. with deep valleys between the peaks.

The climate is that common to Lower Burmah, though the dry zone with semi-arid conditions, begins not very far North. The inhabitants on the West differ little from those of Prome and Pegu as far as their effects on the fauna are concerned and generally speaking as might be expected, the fauna is similar. On the East, however the country is inhabited by a very backward class of hill Karen practising shifting cultivation in the main, and inveterate hunters. I have seen no country in which animals are so scarce except the Chin Hills where conditions are in many ways similar. The result is seen in the scarcity of all mammals on the East bank at any distance from the river. At Thandaung in 14 days collecting only 13 specimens were obtained and though during four days in November we had a mist most of the time and in April were hunting for eggs, I have no hesitation in saying that mammals are far scarcer in the Karen Hills than elsewhere. The older inhabitants say that monkeys used to be comparatively common ; that is, they were generally to be seen or heard near the road. We saw one only and the pace at which it made off was eloquent of its desire to avoid human beings. My collector saw it and says it was darkish brown different from anything we had got ; he had no time to see anything else.

Presumably the reason for this scarcity is to be found in the increase of guns, and in the security enjoyed under British Rule, which allows all and sundry to go hunting in safety whenever they feel like it.

The following animals are said to exist in the area but are not represented in the collection :—

1. *Gibbons.*—Said to have been found in the Karen Hills in the past. None heard or seen. None in the Pegu Yomas.

2. *Tiger.*—Occurs throughout the district. Believed to be on the increase, on account of increased depredations amongst domestic animals, but I think this is largely due to the decrease of game and hunting areas due to the spread of cultivation. The same remarks apply to leopards.

3. The less common forms of small Carnivora are not easy to get. There are certainly some which are not represented. I heard of an *Arctonyx* being caught, but failed to get hold of it.

4. *Otters*—Certainly occur. I have seen tracks and have heard of at least one being shot. We failed to get a specimen, though they are said to do considerable damage in certain fisheries.

5. I was told on very reliable authority that a cat bear had once been seen hanging round a kill in Thandaung. It was not shot, and I think (partly because the beast is said to be strictly vegetarian in its diet) there must be some mistake. It is very difficult to identify an unknown animal from a description.

6. *Bamboo Rats*—There is said to be a big bamboo rat ' about the size of a hare ' in the Karen Hills. I failed to get any specimens.

7. *Porcupines*—I have found spines and deserted burrows.

8. *Elephant*—One herd of about 20 in the North-West, occasional rogues elsewhere.

9. *Rhinoceros*—One reported to turn up periodically. I have no doubt that he wanders over a considerable area, and is probably reported from at least 2 other areas and counted as three beasts instead of one.

10. *Bison*—Occur.

11. *Saing*—Occur. They had been driven away from the area where concentrated extraction of hardwoods was in progress but are now coming back into closed areas after 6 or 7 years.

12. *Serow :*—Reported to occur, but I have never seen signs of them.

13. *Thamin*—(Eld's deer) I have neither seen nor heard of these. They occur to the North of the area.

14. *Pangolin*—I have heard of them, but not seen them. I got a specimen in Pegu.

General Notes. Wherever possible, I have sent fœtuses.

Nos. 1085 and 1088 were entirely omitted in error.

Nos. 1376–1380 and 1478–1486 come from Thandaung 4,500 ft. about. Thandaunggyi is merely a point of rock—20 yards square on the top. *Homo sapiens* inhabits almost at the extreme top—say 4,810 ft. where there is a cave to which a local holy man retires for meditation. I tried to get along the ridge to Leiktho (22 miles north) but a broken path in a steep hillside would not let my elephants across in safety. I may be able to manage it next year, when I hope to improve the collection of these ' Hill ' things.

No. 1489 (a bat) is from Maymyo, caught in a house at night.

It will be noted that the Burmese names are very 'unstable'. Except for animals (including birds) which are either common, or conspicuous or used for food, Burmans do not have any fixed names, or if there is one, the average jungle Burman does not know it. A man with a reputation to keep up promptly coins one if asked. My own collector and I have a series of names by which we know the various animals, but I question whether anyone else would recognize them, e.g. 'the striped squirrel' is *T. macclellandi*, the 'big striped squirrel' *M. berdmorei*. The small carnivora which are not dogs or otters are almost universally 'Kyaung' or cat to the normal Burman; a Tupaia is a squirrel though the Chins have a name for it in the Chin Hills, and this leads to another point. It is the less civilized races, such as Chins, Kachins and Karens who have to depend largely on hunting for their food and consequently have names to distinguish the various species.

In the Prome and Pegu collections (excluding bats) 4 species occur which are not included in the present one. *Pithecus melamerus* (N.B. now *P. pyrrhus shanicus*, *T. B. F.*) *Arctogalidia leucotis*, a Serow and a Pangolin. The first may be the form from the East slopes of the Yomas, but this hardly seems a convincing distribution, and I have heard of a *Semnopithecus* here said to be distinct from the one obtained in the arrangement of hair on the head, but have been unable to get a specimen.

Shooting at night. A hint which may be of use to others is the use of an electric torch at night. All my flying squirrels were obtained this way, their eyes showing up bright red. Many of the civets, etc., were shot in the same way in various fruit trees.

Notes on Specimens

(B = Burmese).

Macaca mulatta.—956, 1148, 1149, 1150, 1322, 1323.

B. *Myauk pin-ne.* (1322 East bank '*Myauk Nee*').

No. 1149 (May 15, 1927) had a young one, about 6 weeks old, still hanging to her. It was caught and got quite tame, too tame, as it was killed by a passing pi-dog.

No. 1322 had No. 1323 and another young one (which got away) with it. I have usually met with them close to cultivation, as opposed to *Semnopithecus*, found in heavy jungle away from villages, usually found in herds of 20–30 or more. Nothing to add to Blanford *re* habits.

Pithecus.—Nos. 1115, 1116, 1420, 1422, 1423, 1426, 1499, 1434.

B. *Myauk-Nyo.*

No. 1429 was found alone in a stream much lower down than usual and alone. 'Orbits white, with blue skin round.'

Usually found in dense high forest in parties of about 20. It is usually the males which are shot, as the females make off at once with their young, on being alarmed. I have twice shot with a rifle (they know the range of a gun, I am sure) males who stayed behind in a very high tree, barking. The whole party in moving follows the same route, running along the same branches and

jumping from and to the same spots, often stopping at the same places for a look back, a useful habit to the collector. Their leaps look tremendous, they seem usually to jump into a group of branches or the top of a lower tree rather than on to a particular branch, spread-eagling themselves so as to distribute the weight. The tail seems of use in balancing.

I have noticed the same trait of sticking to the same route in gibbons and macaques in Katha. I was in camp not far from a *Ficus* in fruit. The first day, 4 or 5 gibbons came to it, the next 20 to 30 macaques. In each case, once they got back from feeding, to certain fixed points all the beasts followed the same route, though this route was different for the two species.

All my specimens are from the West bank, but I saw a party on the East bank one day ; they were very shy, but I had a rifle, and was firing at a stopping point. They are not a very big mark from the shoulder in a high tree, but I must have been very close to one, which fell at least 100 feet, breaking the fall somewhat with branches. It lay still for a bit and I thought it was dead. While I was trying for a second, it suddenly got up, went like a lamplighter and cleared out. I think it cannot have been hit, as there was no blood, but I have never before heard of one falling.

3. *Nycticebus coucang*. 1482. B. ?

This specimen was caught on the tea estate in Thandaung, at 4500 ft. It must have been benighted-or rather be-dayed. I got another about a week before near Toungoo, and still have it alive. It is in all respects similar to the skin, except that the brown stripe and spectacles are perhaps more distinct. I was offered another, but really hadn't the heart to chloroform it. During the day it is inconceivably slow in all its movements absolutely like a slow motion picture but it speeds up considerably at dusk. It feeds on rice, fruit and any insects it can get hold of, though I have found several which it rejects absolutely. Large longicorn beetles and blattidæ seem to be its favourites. It will cling to a branch with its hind legs, and stretch out almost to its full length to grab an insect, which it almost invariably seizes with its hands. It approaches them very slowly with a final grab which might be mistaken for a pounce. I have never seen it actually pounce, or ' throw itself on an insect '. It can cling desperately tight as I found when changing cages. It can also give quite a nasty bite. Its method of seizing prey is a clutch mainly with the fingers and palm as opposed to a hold with the thumb. But the thumb is used in gripping a branch, in moving being opposed to the fingers. So is the hallux. It never seems to come down to the floor of its cage, if it can be avoided, though. I have once seen it fall off a branch when asleep ; it picks things up by clinging with the feet and lowering the body as well as the arms if necessary. I have once seen it drinking by lowering its head to the water. But it can walk in a clumsy way, if put on the ground. It sleeps as described by Blanford.

From the eagerness with which insects are taken—its enormous eyes almost seem to sparkle when one is produced and its whole attitude is one of intense interest and concentration, I imagine that

these must be a considerable item in its diet when wild. If it manages to catch any number of longicorns and grasshoppers or crickets, it must do good. Its method—a slow approach and a final grab—would probably be fairly successful, especially with big insects. On occasions, it has caught big moths on the wing in its cage, but I am not sure what luck it would have in the open, except when wings are being dried after emergence from the pupa.

Felis bengalensis.—One killed on or near the Thandaung tea estate, the second in dense jungle. Burmese, *Kyaung Ba*, or *Kyaung Kwet.*

Felis affinis.—Shot round Toungoo, for the most part, usually found near villages, with wild domestic cats, with which it is said to inter-breed. Burmese, *Kyaung Bā.*

Viverra zibetha.—One or two seen at night, but they made off from the light too quickly to give a chance. One dried skin. Burmese, *Kyaung Myin.*

Viverricula malaccensis.—Burmese *Kyaung pazun-gaw* or *Kyaung Na Tha.* One killed contained 4 fœtuses.

Paradoxurus birmanicus.—One lives in a palm in my garden. Three more lived in the roof of my house in Katha. No. 1474 contained two fœtuses only ; they were mostly shot feeding on various fruit trees.

Herpestes birmanicus.—Burmese, *Mwe ba*; obtained in the scrub jungle round Toungoo.

Herpestes urva.—Shot on a path in the hills round Thandaung. The stomach contained fragments of the shell of some crustacean.

Canis aureus.—Burmese *Kway-at* ; *Kye kway* is probably strictly a fox, and *Wunbalwe* a wolf, though my specimen got all three names given it by the pandits consulted. It was shot coming to a light, in an open Indaing reserve, in which half a dozen or so are said to live now. It is the only record of which I know so far from the dry zone, where they are fairly common in places.

Cuon sp.—I sent in a skin shot about 20 miles South of Toungoo but, I believe it was lost. (It was never sent to the S. Kensington Museum. *T. B. F.*) No. 1089. The beast is said to have gone for the man who shot it. The skin was in very bad condition and had no skull.

Charronia flavigula.—Burmese *Thit-tet-she.* The specimen sent was one killed by dogs out of 4 or 5. I have seen another (a dark specimen) in the jungle on the West bank and a second (a light one) nearly on the top of Thandaunggyi.

Melogale personata.—Burmese *Kyaunga U-Gyi.* Caught in a garden.

Tupaia belangeri.—Burmese "*Swe*' 3 prs. abd. mammæ, and not as stated by Blanford 2 prs. only. Near a certain rest house one of these little beasts turned up every day, at the same hour (about 3.45 p.m.) and ran along the fence, getting on to it, and getting off it at the same points. One day I saw it come off the fence into the compound and eat something—apparently the seeds of some weeds. They are usually found in scrub jungle, or heaps of rubbish.

The pigmy shrews.—Usually caught when driven out of their

burrows by floods. Two were found, fighting fiercely at the mouth of a tiny hole. They were brought back in a vaseline bottle just being able to run round the bottom in 'tandem' without getting in each other's way.

Bats.—Burmese (generic), *Linok.*, *Pteropus* sp. *Lin Swe.* I have given notes on the labels as to where each was found. My collector is not very good on them, and I have little doubt that there are a good many more than I have found. The one exception is the *Megaderma.* Three of these were found flying round a jungle bungalow. I can confirm Mr. Frith's remarks quoted in Blanford, in every respect. The beasts used to drop frogs' hind quarters, etc., on my mosquito curtain. On one occasion a mouse's head was picked up. Remains of small fish were found, though how bats catch a fish, I am not prepared to guess. Frogs and mice would seem to present sufficient difficulties, even allowing the beast to have the powers of a hawk or owl. They are not very big.

Petaurista (Large Flying Squirrel)—Burmese *Shu Byan.* Shot feeding at night. Feeds on shoots as well as fruits. Very destructive to tree seeds of all sorts, especially Pyinkado (*Xylia dolabriformis*). I have never seen nests down here such as I have found in the Upper Chindwin.

Small Flying Squirrel:—A very inadequate lot, I am afraid. Burmese *Shing Shu.* A wood-cutter told me he had seen about three dozen of these come out of one hollow tree which he felled.

Squirrels.—Burmese (generic), *Shing.*

Ratufa.—Burmese *Shing-apaw* (not *apan*, Blanford) Upper Burma), *Lin-thet* (Lower Burma). I can find nothing governing the colour variations from brown to black, having shot two specimens almost extreme in both directions from one tree at the same time. A squirrel of high forest. Has a habit of lying asleep along a branch, and the only thing to be spotted is the tail hanging down.

Callosciurus ferrugineus—Burmese *Shing-apaw*, or *Shing Ni-paw.* Found on both banks but I have not found it on the East bank, farther up than 25 miles North of Toungoo.

A squirrel of high forest and tree tops.

Callosciurus rufigenis.—Only found round Thandaung, say above 3,000 ft. (East bank).

Tomeutes phayrei.—Burmese *Shing apaw.* Only found upon the East bank. Some seem to have *grey* feet. Lives in high forest, where I have seen both it and *C. ferrugineus* diligently eating teak seed off the tree.

Tomeutes pygerythrus:—Common in the scrub round all villages and in all clearings and gardens, rare in heavy jungle.

A friendly little animal. I have two in my garden, who run along the same branches, of the same rain-tree, in exactly the same way, and at exactly the same time, every day, just outside my bed-room window. They are even more punctual than my boy in waking me by their shrill squeaks. They eat all my custard apples and I regret to say, were once guilty of eating the eggs of a magpie robin which built in the rafters of my verandah. They often come down to the ground and run across my lawn from hedge to a palm. I have also often seen them on the ground in the jungle. They run very quick-

ly for their size, on the ground, but on trees, they have a funny, jerky motion, almost hopping in fits and starts, both when spread-eagled on the bole and running along a branch. They jerk their tails in time with their movements, in a most amusing way.

Tamiops macclellandi.—Burmese *Shing*, *Gya.* A squirrel of medium and high forest, never found on the ground. It has a shrill high squeak like a bat's which some people cannot hear. It is very shy, and very quick and so very difficult to get, as it lies flat on a branch, and is completely lost from below.

Menetes berdmorei.—Only found on the West bank and very scarce at that, though it may be mistaken for *pygerythrus*, which it closely resembles in its habits. Blyth is incorrect in doubting that it ever ascends trees. I have shot one out of a tree 40 ft. high. But I think it prefers the ground and scrub, also heaps of firewood and branches. Always found round clearings for cultivation, but usually in rather jungly clearing; i.e., not close to the railway with a long stretch of paddy fields between it and the nearest real jungle.

Bandicoots, Rats & Mice.—Burmese (generic, *Kywet*, Bandicoots, *Mye Kywet*). I am afraid I do not know enough about them to give any details other than those on the labels. Some were caught in a nursery feeding on Kalaw seed (*Taraktogenos Kurzii*) and I should be glad to know their names Nos. 879–887 and 900–903.

(See corrected list of spirit specimens appended. *T. B. F.*).

They do much damage, and the first step in stopping it seems to be identification.

Bamboo Rats.—Burmese; *Pwe* I have never heard Blanford's '*Khai*' I found one lying dead on a jungle path—no apparent reason. Common.

Lepus peguensis.—Burmese *Yon.* It is to be remembered that at the time Blanford wrote what is practically now Lower Burmah, was then called Pegu. Most of my specimens were shot with the aid of 'Mok So Kwaya' or hunting dogs; the dogs got to some of the specimens before they could be collected, but they lost some behind bunds or furrows. I saw one which I had been after for some days, put up out of a patch of weeds by a crowd going home after a football match. It took refuge in a drain, but was promptly got out with a bamboo and taken home to or for dinner. I have often put them up in scrub jungle round villages; they make a 'form' under a tuft of grass or small shrub and sit very tight; when put up in scrub jungle, they jink so much as to be almost unshootable. I have never heard of them using holes, but they may do so. All I have put up have been from forms; they are undoubtedly filthy feeders, and should not be eaten if shot near any human habitation.

They are quite easy to get with dogs in the rains, when their movements are circumscribed by floods. I have heard on good authority of 5 being seen together in a jungle bungalow compound on a moonlight night.

Muntiacus.—Burmese *Gyi.* Very common. I shot one with its stomach full of 'gwe' (*Spondias mangifera*, Willd.) fruit. The fruit had been eaten whole.

Sambhur.—One skin. Burmese *Sat.* Quite common, judging from tracks but I have never seen one here. They chew the bark off young Yemané (*Gmelina arborea*) trees to such an extent that they kill whole plantations. They also break and eat the leading shoots of smaller trees. Once a plantation is found it is killed out.

Hyelaphus porcinus.—Burmese *Daye.* All those shot were obtained when they were cut off on temporary islands made by floods. The method leaves much to be desired from a sporting point of view but the specimens were wanted. In any case—a plea of very doubtful validity—they would have been killed and eaten when cut off in this way. I am sure the animal mortality is very heavy from this cause; floods come up every year, and I think every beast cut off in this way ends up in someone's cooking pot. They are gramivorous and require long periods for feeding, given time, they can be killed by starvation and exhaustion consequent on continuous hunting and harrying as every local man knows.

Sus cristatus.—Burmese *Wet.* (*Taw Wet* = jungle pig). Very common, but also very wily. Tracks all over the place, but I have only seen one, and he got away before I could get a gun. My man has spent a good deal of time trying to get specimens and the only result is the juvenile skin sent.

I am afraid the above are rather scratch notes. I have put in full details on my labels and have tried not to repeat them here.

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Deputy Conservator of Forests,
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MACACA MULATTA, Zimm.

The Rhesus

(Synonymy in No. 16).

Toungoo, ♂ 2, ♀ 1; 13 miles E. of Toungoo, ♂ 1, ♀ 1.

PITHECUS PYRRHUS PHAYREI, Blyth.

Phayre's Langur

(Synonymy :—See note below)

30 miles N. of Toungoo, ♂ 3; 30 miles N. W. of Toungoo, ♀ 2.
35 miles N. W. of Toungoo, ♀ 1.

No specimen of what was known as *P. obscurus barbei* which closely resembles *P. p. phayrei*, was obtained during the Survey, although it may exist in some of the areas worked over. Mr. Pocock has recently reviewed the Indian Langurs, and his classification is now adopted; his reasons for removing this monkey from the *obscurus* group will be found in his paper published in the Society's Journal (Vol. xxxii).

PTEROPUS GIGANTEUS, Bruenn.

The Indian Flying Fox

(Synonymy in No. 2)

Toungoo, ♂ 2, ♀ 5.

CYNOPTERUS SPHINX SPINX, Vahl.

The Southern Short-nosed Fruit Bat

(Synonymy in No. 6.)

Toungoo, ♂ 3, ♀ 3 ; 40 miles N. of Toungoo, ♂ 1.

In the first collection from Toungoo the single specimen of *Cynopterus* included was reported as *C. brachyotis angulatus*, making it apparent that both species (if indeed there are two species) exist in this locality ; the present specimens have a somewhat longer fore-arm and the skulls are of a slightly heavier type, broader more especially in the brain case ; otherwise there is no very marked difference in the two species.

CYNOPTERUS BRACHYOTIS ANGULATUS, Mill.

The Malay Short-nosed Fruit Bat

(Synonymy in No. 17)

Toungoo, ♂ 1, ♀ 2 ; 16 miles W. of Toungoo, ♂ 3, ♀ 3.

These specimens show the slight differences from *C. sp. spinx* noted above and are classed accordingly. It may however be added that Mr. J. H. Lindsay, I.C.S. (retired) has recently studied these bats and could not find any definite grounds for separating the one from the other.

RHINOLOPHUS AFFINIS TENER, K. And.

The Pegu Horse-shoe Bat

1905. *Rhinolophus affinis tener.* K. Andersen, Pros. Zool. Soc. vol. 2, p. 75.

Toungoo, ♂ 1 ; 40 miles N. E. of Toungoo, ♀ 1.

K. Andersen separated this bat from *R. affinis* on a spirit specimen obtained from Pegu, though recognizing it as a species closely allied to *R. rouxi*. No doubt the bat is comparatively rare except perhaps in this part of Burmah.

HIPPOSIDEROS BICOLOR, Temm.

The Bicoloured Leaf-nosed Bat

1835. *Rhinolophus bicolor*, Temminck, Mon. Mam. ii. p. 18.
1838. *Hipposiderus fulvus*, Gray, Mag. Zool. Bot. ii, p. 492.
1889. *Hipposiderus bicolor*, Blanford's Mamm. No. 166.

Thangdaung, 20 miles N. E. of Toungoo, ♀ 1.

LYRODERMA LYRA, Geoff.

The Indian Vampire Bat

(Synonymy in No. 1)

36 miles N. of Toungoo, ♀ 1.

SCOTOPHILUS CASTANEUS, Horsf.

The Chesnut Scotophil

(Synonymy in No. 17)

Toungoo, ♂ 7, ♀ 8, 3 unsexed ; 40 miles N. E. of Toungoo, ♂ 6, ♀ 6.

Ten specimens of this bat obtained in Tenasserim by Mr. G. C. Shortridge were shown in Report No. 17, as *S. wroughtoni*, this error being subsequently corrected by Mr. Wroughton. These two bats are not readily distinguishable, but *S. castaneus* is slightly the larger of the two, the skull being of a distinctly heavier type and somewhat longer. As in the case of the *Cynopterus* these two species appear to meet in Burmah somewhere about the latitude of Toungoo.

TAPHOZOUS LONGIMANUS, Hardw.

The Long-armed Sheath-tailed Bat

(Synonymy in No. 6)

30 miles N. of Toungoo, ♂ 1, ♀ 1; 16 miles N. of Toungoo, ♂ 3, ♀ 4.

The range of this bat is a very wide one, covering the greater part of India and Burmah. Blanford states that it is found in Ceylon, but no specimens were

procured from the Island by the Survey, nor again were any received from East of Palanpur or from N. W. Punjab. (*Re* occurrence of this species in Ceylon and change of colouring from young to adult see note by W. W. A. Phillips, vol. xxxii, p. 371 of the Journal. EDS.)

TUPAIA BELANGERI, Wagn.

The Burmese Tree Shrew

(Synonymy in No. 17.)

Toungoo, ♂ 2, ♀ 1 ; 30 miles N. of Toungoo, ♀ 1.
6 miles E. of Toungoo, ♂ 3, ♀ 2 ; 30 miles N. W. of Toungoo, ♂ 1.
36 miles N. E. of Toungoo, ♂ 2 ; 10 miles N. of Toungoo, ♂ 2, ♀ 1.
30 miles N. W. of Toungoo, ♂ 6 ; 35 miles N. of Toungoo, ♂ 1 ; 40 miles N. of Toungoo, ♂ 1.

SUNCUS FULIGINOSUS, H. Lindsay.

The Common Pegu Shrew

Toungoo, ♀ 7 ; 40 miles N. E. of Toungoo, ♂ 1.
Beyond noting that the older generic name 'SUNCUS' has been reverted to in the place of 'PACHYURA', no remarks are called for here, as details regarding this and other Indian Shrews will be found in Mrs. Lindsay's paper on the subject published in the Society's Journal, vol.xxxiii, p. 326.

CROCIDURA KINGIANA, And.

King's Shrew

6 miles E. of Toungoo, ♀ 1.

FELIS AFFINIS, Gray.

The Jungle Cat

Toungoo, ♂ 2, ♀ 3 ; 6 miles E. of Toungoo, ♂ 1.

FELIS BENGALENSIS, Kerr.

The Leopard Cat

(Synonymy—See remark in No. 2)

Thandaung, 20 miles N. E. of Toungoo, ♂ 1 ; 40 miles N. W. of Toungoo, ♂ 1.

FELIS DOMESTICUS

The Tame Cat

Toungoo, ♂ 3.
One yellowish and two greyish coloured, varieties that may be found almost anywhere.

FELIS MARMORATA, Martin.

1836. *Felis marmorata*, Martin, P. Z. S. p. 109.
1846. *Felis charltoni*, Gray, A. M. N. H. xviii, p. ii.
1849. *Felis marmorata*, Blanford's Mamm. No. 33.
Two native dried skins, no other specimens obtained by the Survey.

FELIS PARDUS, L.

The Panther

Skin from Toungoo District but no details given.

VIVERICCULA MALACCENSIS, Gmel.

The Small Indian Civet

(Synonymy in No. 3.)

1 unsexed. No details.

PARADOXURUS BIRMANICUS, Wrought.

The Burmese Palm Civet

(Synonymy in No. 16.)

6 miles E. of Toungoo, ♂ 4, ♀ 1 ; 30 miles N. W. of Toungoo, 2 unsexed.
40 miles N. W. of Toungoo, ♂ 1.

HERPESTES BIRMANICUS, Thos.

The Small Burmese Mongoose

Toungoo, ♂ 4, ♀ 4 ; 40 miles N. of Toungoo, ♂ 1, 1 unsexed.

CANIS AUREUS, L.

The Jackal

6 miles E. of Toungoo, ♂ 1.
Jackals from Mt. Popa and Chindwin were reported as *C. indicus* but possibly *indicus* as a specific name will be dropped when Blanford's Mammalia is revised, since it seems to be generally recognized that all the Jackals are of one species.

CHARRONIA FLAVIGULA, Bodd.

The Northern Indian Marten

(Synonymy in No. 15.)

35 miles N. W. of Toungoo, 1 unsexed.

HELARCTOS MALAYANUS, Raffles.

The Malay Bear

(Synonymy in No. 14.)

40 miles N. E. of Toungoo, 1 unsexed.

PETAURISTA CINERACEUS, Blyth.

The Tenasserim Brown Flying Squirrel

(Synonymy in No. 29.)

20 miles N. of Toungoo, ♂ 3, ♀ 2 ; 30 miles N. of Toungoo, ♂ 6 ; 36 miles N. W. of Toungoo, ♀ 1. 13 miles E. of Toungoo, ♀ 1 ; 6 miles E. of Toungoo, ♀ 1 ; 30 miles N. W. of Toungoo, ♂ 2 ; 40 miles N. W. of Toungoo, ♂ 1.

BELOMYS TRICHOTIS, Thos.

The Black-eared Belomys

(Synonymy in No. 20.)

13 miles E. of Toungoo, ♀ 1.
The English name given here was proposed by Mr. Wroughton to distinguish *B. trichotis* from *B. pearsoni* which has red ears.

HYLOPETES PHAYREI PROBUS, Thos.

Blyth's Flying Squirrel

(Synonymy in No. 16.)

5 miles . E. of Toungoo, 1 unsexed ; Toungoo, ♂ 1.
20 miles N. of Toungoo, ♂ 1, ♀ 1.

RATUFA PHÆOPEPLA MARANA, Thos & Wrought.

The Central Burmese Giant Squirrel

(Synonymy in No. 16.)

6 miles E. of Toungoo, ♀ 2 ; 10 miles N. of Toungoo, ♂ 1.
20 miles N. of Toungoo, ♂ 2 ; 30 miles N. of Toungoo, ♂ 1.
36 miles N. of Toungoo, ♂ 3, ♀ 1 ; 40 miles N. of Toungoo, ♂ 1.
30 miles N. W. of Toungoo, ♂ 3.
A specimen of this Squirrel was incorrectly reported in No. 46. as *R. gigantea*. The English name was altered in the Pegu Report. No. 29.

DREMOMYS RUFIGENIS ADAMSONI, Thos.

The Red-cheeked Squirrel

(Synonymy in No. 14.)

Thandaung, 4,500, feet, 20 miles N. E. of Toungoo, ♀ 2.

CALLOSCIURUS FERRUGINEUS, F. Cuv.

The Burmese Bay Squirrel

(Synonymy in No. 16.)

30 miles N. of Toungoo, ♂ 5, ♀ 2 ; 36 miles N. of Toungoo, ♂ 6, ♀ 5.
30 miles N. W. of Toungoo, ♂ 2, ♀ 4 ; 40 miles N. W. of Toungoo, ♂ 2.
30 miles N. E. of Toungoo, ♀ 1.

TOMEUTES PHAYREI PHAYREI, Blyth.

Phayre's Squirrel

(Synonymy in No. 14.)

Toungoo, ♂ 2, ♀ 2 ; 5 miles E. of Toungoo, ♂ 2, ♀ 3.
6 miles E. of Toungoo, ♂ 3, ♀ 1 ; 16 miles N. of Toungoo, ♂ 1 ; 20 miles E. of Toungoo, ♂ 1.
10 miles N. of Toungoo, ♂ 1, ♀ 2 ; 40 miles N. E. of Toungoo, ♂ 1.

TOMEUTES PYGERYTHRUS, Geoff.

The Irrawady Squirrel

(Synonymy in No. 29.)

16 miles N. of Toungoo, ♂ 5, ♀ 2 ; 20 miles N. of Toungoo, ♂ 1, ♀ 1.
30 miles N. W. of Toungoo, ♂ 3, ♀ 3 ; 40 miles N. of Toungoo, ♂ 3, ♀ 6.
Toungoo, ♂ 3, ♀ 3.

MENETES BERDMOREI, Blyth.

Berdmore's Squirrel

(Synonymy in No. 16.)

35 miles N. of Toungoo, unsexed 1 ; 36 miles N. of Toungoo, ♂ 2

MENETES BERDMOREI DECORATUS, Thos.

Berdmore's Squirrel

(Synonymy in No. 16.)

10 miles N. of Toungoo, ♂ 1 ; 6 miles N. of Toungoo, ♀ 1 ; 30 miles N. W. of Toungoo, ♀ 1.

TAMIOPS MACCLELLANDI BARBEI, Blyth.

The Striped Burmese Squirrel

(Synonymy in No. 14.)

6 miles E. of Toungoo, ♂ 4, ♀ 2 ; 8 miles W. of Toungoo, ♀ 1 ; 13 miles E. of Toungoo, ♂ 1.
30 miles N. W. of Toungoo, ♂ 1 ; 35 miles N. of Toungoo, ♂ 1.

BANDICOTA NEMORIVAGA, Hodgs

The Smaller Bandicoot Rat

1836. *Mus* (*Rattus*) *nemorivaga*, Hodgson, J.A.S.B. , p. 234.
1878. (*Nesokia*) *elliotanus*, Anderson, J.A.S.B. xlvii, p. 231.
1889. *Nesokia bandicota*, Blanford's Mammalia, No. 296.
Toungoo, ♀ 6.
This bandicoot was incorrectly recorded as *B. elliotana* in Report No. 19.

GUNOMYS VARIUS, Thos.

The Malay Mole-Rat

(Synonymy in No. 17.)

Toungoo, ♂ 7, ♀ 5 ; 35 miles N. of Toungoo, ♂ 1.

Among these specimens were skins of 9 young ones which were originally identified as *B. savilei*, but Mr. Thomas has recently been working on this species and has now definitely classed all the specimens in Mr. Mackenzie's last two collections as *Gunomys varius*.

RATTUS CONCOLOR, Blyth

The Little Burmese Rat

(Synonymy in No. 17)

Toungoo, ♂ 4, ♀ 4 ; 6 miles E. of Toungoo, ♂ 1 ; 30 miles N of Toungoo, ♂ 1.

RATTUS RATTUS KHYENSIS, Hint

The Shan Tree Rat

1918. *Rattus rattus khyensis*, Hinton, J.B.N.H. Soc. vol. xxv, p. 60.

Toungoo ♂ 3 ♀ 6 ; 36 miles N. of Toungoo, ♂ 5, ♀ 2 , unsexed 1.

40 miles N. W. of Toungoo, ♂ 1, ♀ 2.

The white bellied rat from this district is undoubtedly similar to that found in the Shan States, the type locality of *khyensis*.

RATTUS RATTUS RUFESCENS, Gray.

The Common Indian Rat

(Synonymy in No. 1)

Toungoo, ♀ 2, ♂ 1.

MUS HOMOURUS, Hodgs.

The Himalayan House Mouse

(Synonymy in No. 15.)

Toungoo, ♂ 16, ♀ 12, unsexed 1 ; 36 miles N. of Toungoo, ♀ 4.

40 miles N. of Toungoo, ♂ 1, ♀ 6, unsexed 2.

CANNOMYS PATER, Thos.

The Bay Bamboo Rat

(Synonymy in No. 14.)

11 miles N. of Toungoo, ♀ 1 ; 10 miles N. of Toungoo, ♂ 3, ♀ 8.

LEPUS PEGUENSIS, Blyth.

The Pegu Hare

(Synonymy in No. 16)

Toungoo, ♂ 9, ♀ 4 ; 30 miles N. of Toungoo, ♂ 1.

40 miles N. of Toungoo, ♂ 4, ♀ 2 ; 40 miles N.W. of Toungoo, ♂ 1.

MUNTIACUS GRANDICORNIS, Lydd.

The Tenasserim Rib-faced Deer

(Synonymy in No. 2)

Toungoo, ♀ 1 ; 11 miles N. of Toungoo, ♀ 1 ; 30 miles N.W. of Toungoo, ♂ 1.

35 miles N.W. of Toungoo, ♀ 2 ; 36 miles N. of Toungoo, ♀ 1 ;

40 miles N. of Toungoo, ♂ 1.

The Muntjac is found throughout India, Ceylon, Burmah, Malay States, etc. and showing slight differences in size, color and horns has consequently been separated into a number of species by various zoologists, but it would appear to be very doubtful whether all these species are worthy of recognition. Quite possibly after further study of these small deer it may be decided that they are all of one species, varying slightly according to local conditions, and therefore entitled only to subspecific or racial names.

CERVUS ELDI, Guthrie.

The Pegu Thamin

1842. *Cervus eldi*, Guthrie, Calc. Jour. N. H. ii, p. 417.
1888. *Cervus eldi*, Blanford's Mammalia No. 366, p. 541
Toungoo, ♀ 1.

HYELAPHUS PORCINUS, Zimm.

The Hog Deer

(Synonymy in No. 20)

Toungoo, ♂ 2.

SUS CRISTATUS, Wagner.

The Indian Wild Boar

(Synonymy in No. 5)

10 miles N. of Toungoo, ♂ 1. (juv.)
An interesting specimen, illustrating the striped appearance of the very young animal.

SPIRIT SPECIMENS

List (duly amended) attached to third Collection.

879.	*Rattus manipulus*	22- 9-1926	Toungoo.
880.	,, *concolor*	28-10-1926	,,
881.	,, ,,	,,	,,
882.	,, ,,	,,	,,
883.	,, ,,	31-10-1926	,,
884.	,, ,,	7-11 1926	13 miles E. of Toungoo.
885.	,, ,,	3-11-1926	,,
886.	,, ,,	8-11-1926	,,
887.	,, *r khyensis* (melanistic)	,,	,,
893.	,, ,,	14-12-1926	Toungoo.
894.	*Cynopterus sp. sphinx*		,,
895.	,, ,,		30 miles E. of Toungoo.
896.	,, ,,		Toungoo.
897.	,, ,,		30 miles N. of Toungoo.
900.	*Rattus concolor*	11-11-1926	13 miles E. of Toungoo.
901.	,, ,,	19-12-1926	,,
902.	,, *manipulus*	22- 9-1926	,,
903.	*Chiropodomys gliroides*	2-10-1926	,,
926.	*Cynopterus sp. sphinx*	10- 1-1927	Toungoo.
927.	*Hipposideros bicolor*	,,	,,
966.	*Scotophilus castaneus*		,,
1027.	*Tomeutes pygerythrus*	(fœtus) (ex 1006)	
1045.	*Cynopterus sp. sphinx*	(fœtus ex 1044 name doubtful)	
1047.	,, ,,	(ex 1046 ,, ,,)	
1049.	,, ,,	(ex 1048 ,, ,,)	
1055.	*Taphozous longimanus*	(fœtus ex 1053)	
1064.	*Tupaia b. belangeri*	(fœtus ex 1063)	
1127.	,, ,,	(fœtus ex 1125)	
1087.	*Felis pardus*	(fœtus ex 1087)	
1130	*Scotophilus castaneus*		Toungoo.
1132.	*Rattus concolor*	13- 5-1922	36 miles N. of Toungoo.
1133.	*Lepus peguensis*	19- 5-1927	Toungoo.
1145.	*Tomeutes pygerythrus*	(fœtus ex 1144)	
1174.	*Mus homourus*	1- 6-1927	Toungoo.
1175.	*Mus homourus* (juv.)	1- 6-1927	,,
1184.	*Suncus nudipes*	4- 6-1927	,,

1201.	*Mus homourus* (juv.)	12- 6-1927	Toungoo.
1202.	,, ,,	,,	,,
1203.	,, ,,	,,	,,
1204.	,, ,,	,,	,,
1231.	*Scotophilus castaneus*	20- 6-1927	,,
1232.	,, ,,	,,	,,
1236.	,, ,,	21- 6-1927	,,
1265.	*Suncus nudipes*		,,
1292.	*Cynopterus sp. sphinx*	(fœtus ex 1268)	(name doubtful)
1294.	*Cervus eldi*	(fœtus ex 1293)	
1309.	*Mus homourus*	(fœtus ex 1258)	
1311.	*Rattus concolor*	22- 8-1927	36 miles N. of Toungoo.
1353.	*Cynopterus sp. sphinx*		Toungoo.